

# Smart Aligner – Advanced App Course



*MultiWave Sensors*

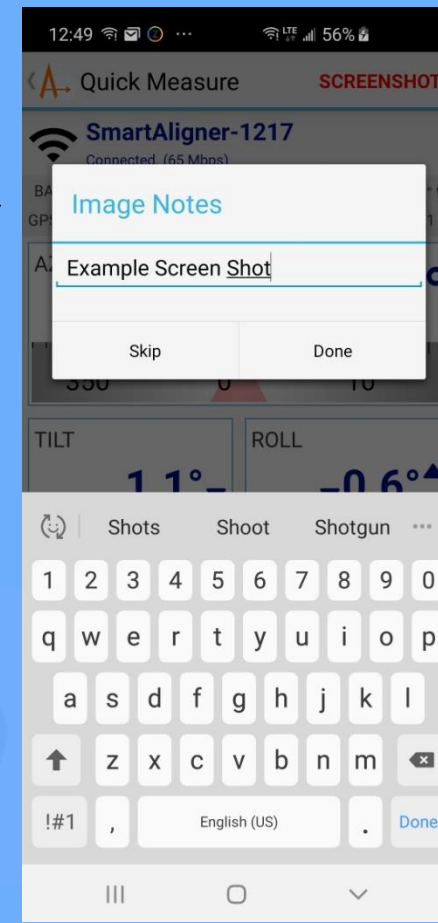
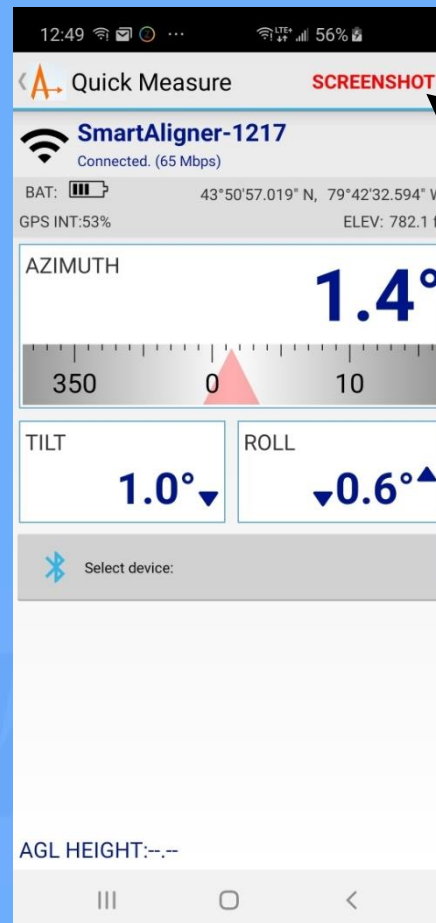
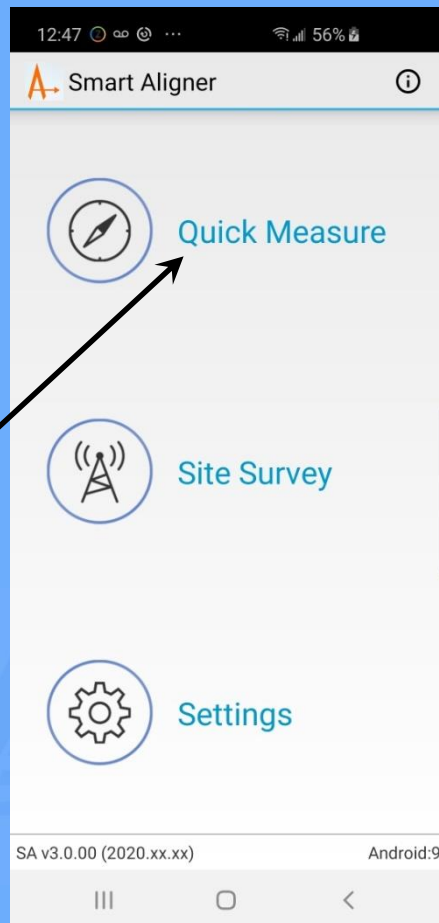
# Topics Covered

Note: This training course assumes that the Introductory Course has been completed and the user is familiar with the basic operation of the Smart Aligner System.

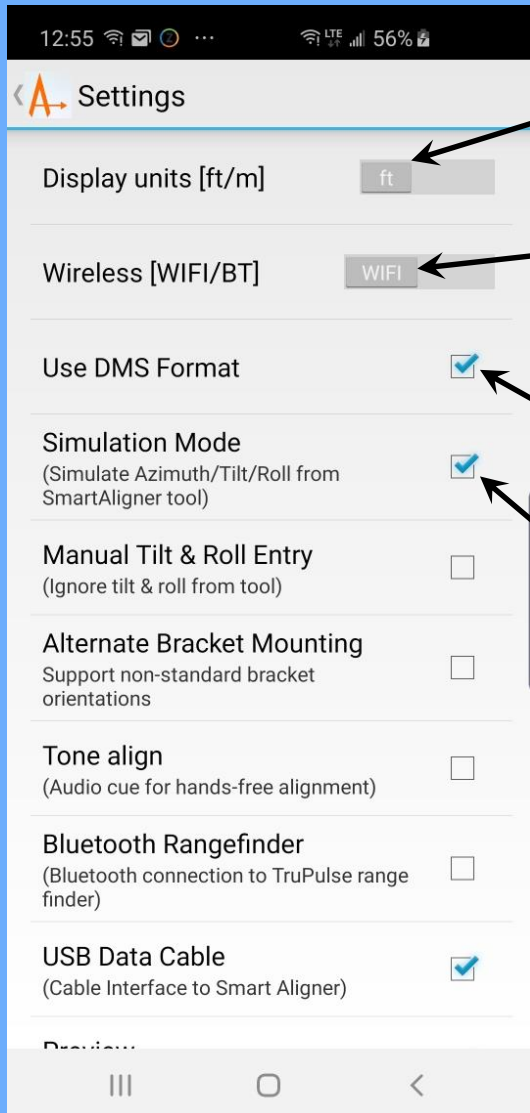
1. Quick Measure: Slide 3
2. Settings: Slides 4 - 13
3. Deleting or Duplicating an Antenna File: Slides 14 - 15
4. Deleting or Exporting a Site: Slides 16 - 18
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7. Anritsu File Integration: Slides 29 - 36

# App Menu – Quick Measure

1. Quick Measure can be used to capture an alignment without targets. A **SCREENSHOT** can be saved with a custom note appended to it.



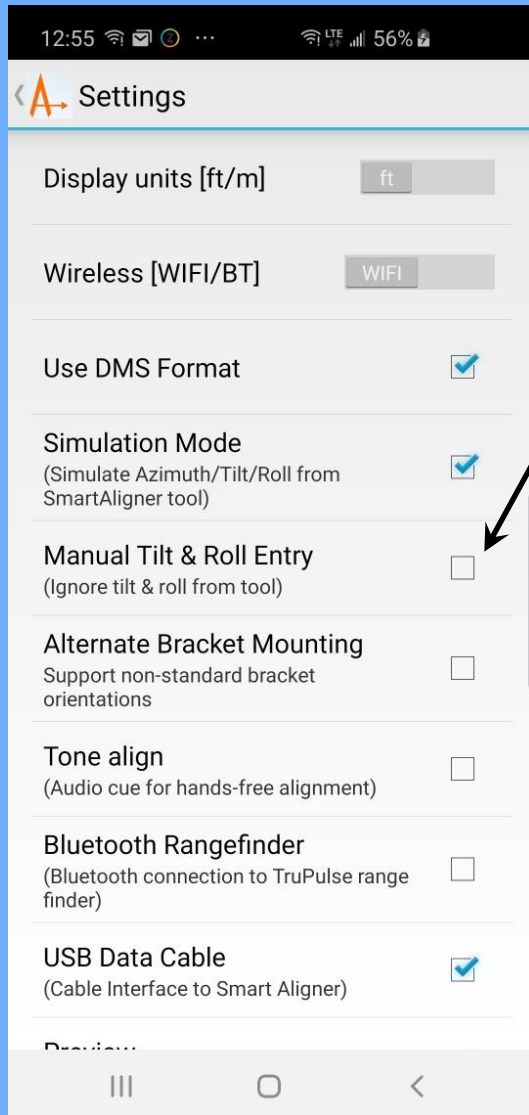
# App Menu – Settings



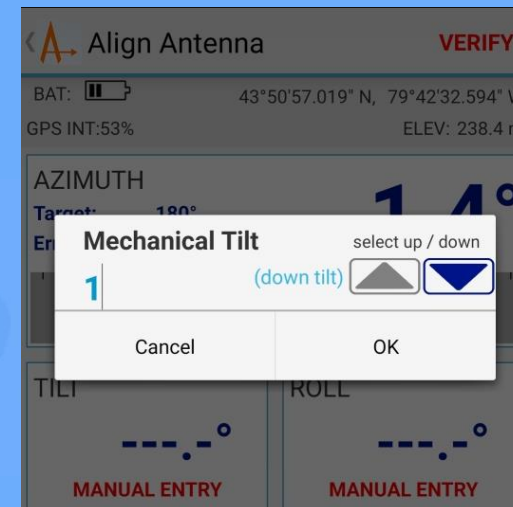
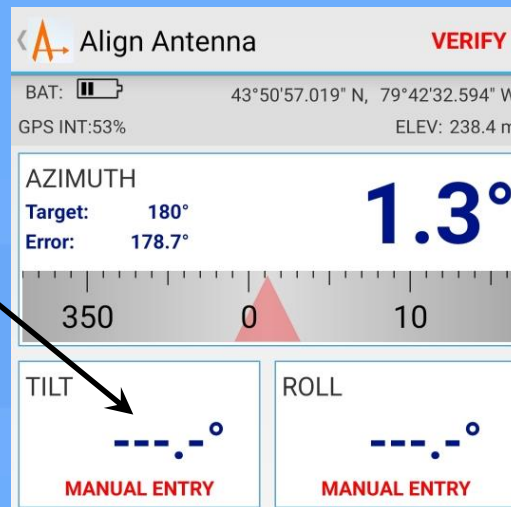
1. Set the Display Units for the app screen and reports to Feet (default) or Meters.
2. Choose between Wi-Fi (default) or BT. BT requires a new Tool (Serial # >3001) or updated Carrier Board and wireless set to BT (see Advanced Tool Course).
3. Set the Lat/Long position format to DMS (default on). If unchecked, the format is D.DDDDD.
4. Simulation Mode generates information as if it were connected to the Tool for evaluation and training purposes (default on). Remember to disable before connecting to the Tool. The Measurement Screen will have a red SIMULATION watermark on it.



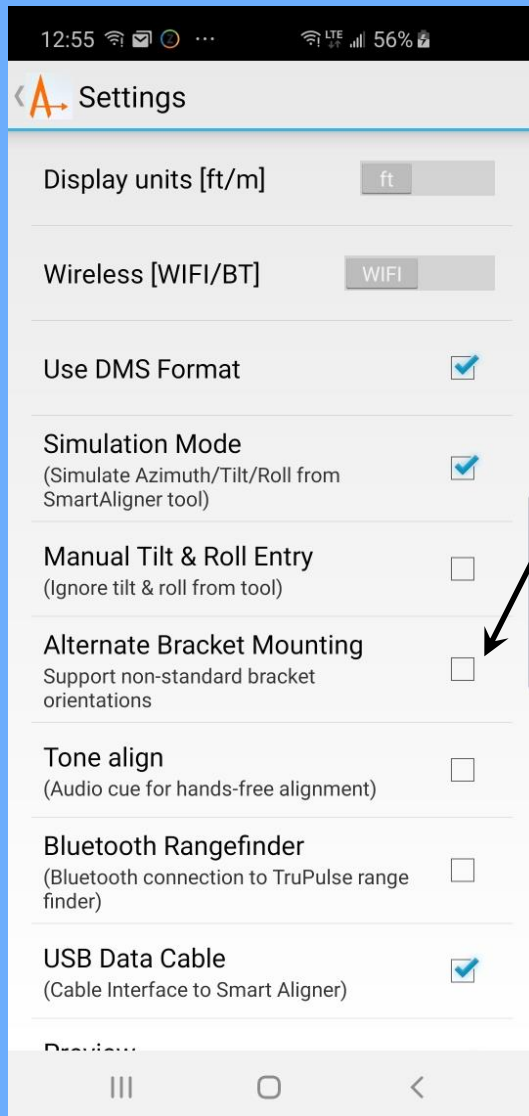
# App Menu – Settings



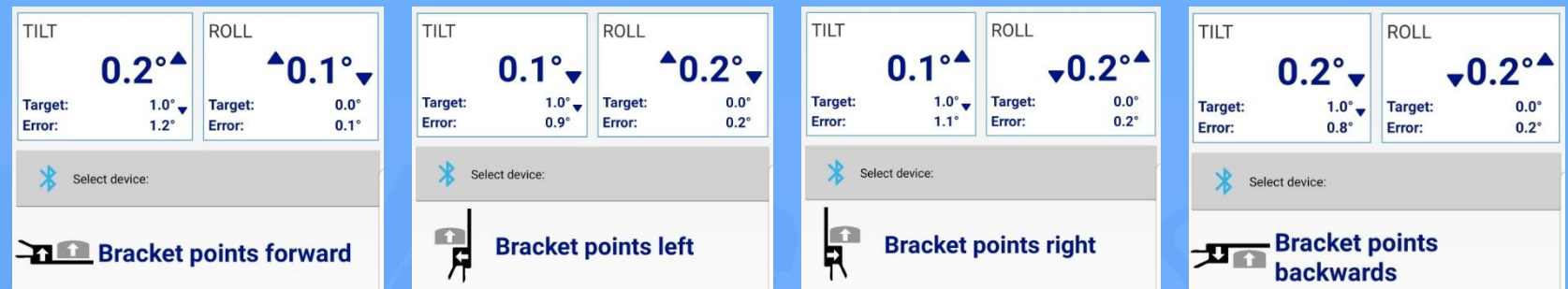
5. Select Manual Tilt & Roll if the carrier will not allow automatic Tilt and Roll information from Tool. Alternate inclination data is entered manually on measurement screen by selecting the field (default off).



# App Menu – Settings

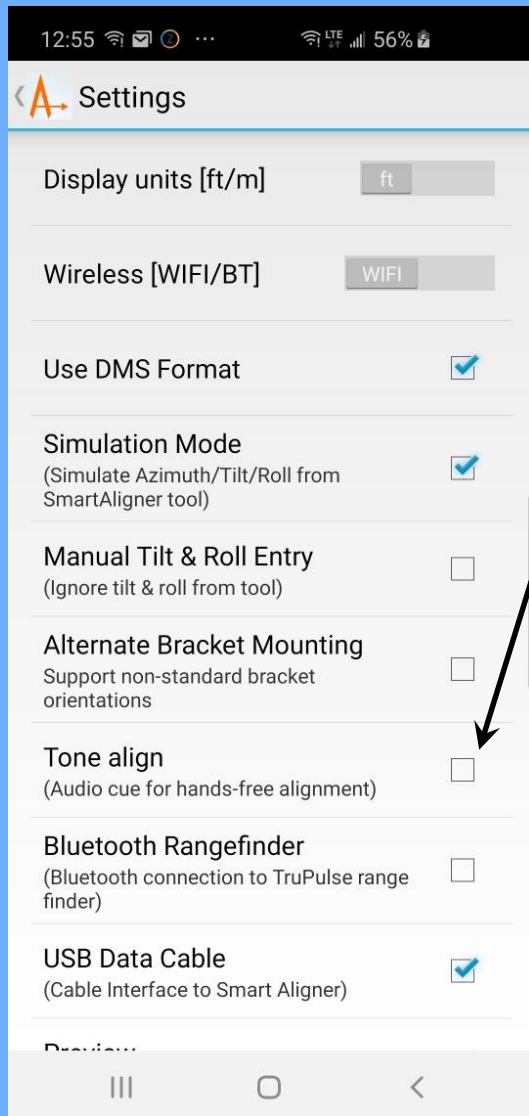


6. Select Alternate Bracket Mounting if you want to mount the Bracket in a different orientation than designed (default off). An icon appears on the measurement screen for alternate orientations as follows:

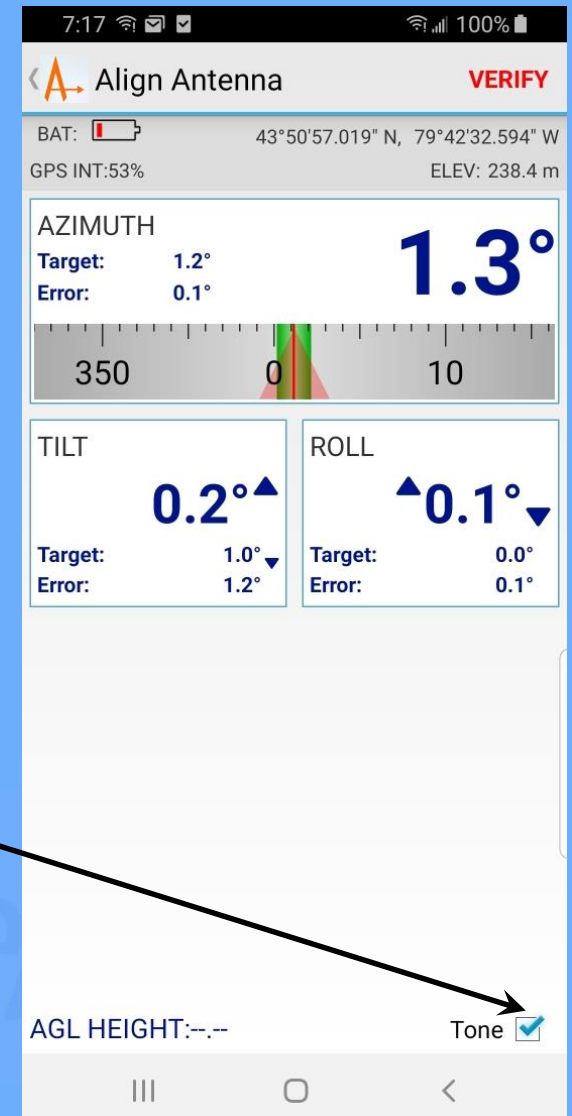




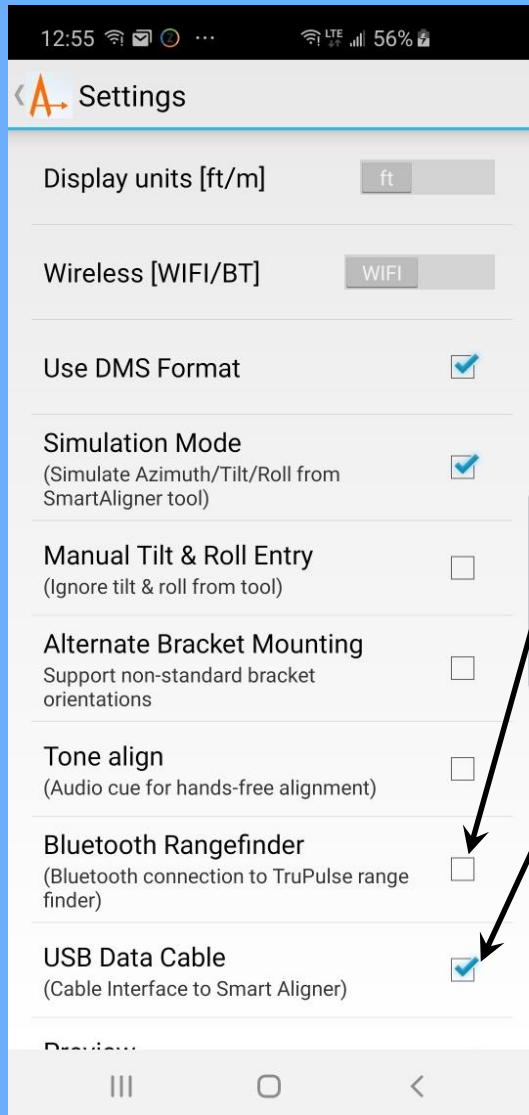
# App Menu – Settings



7. Select Tone Align to have the phone beep during alignment. The beep gets more rapid and at a higher frequency when the target is approaching (default off). This allows both hands to align the antenna. User enables and disables from the measurement screen.



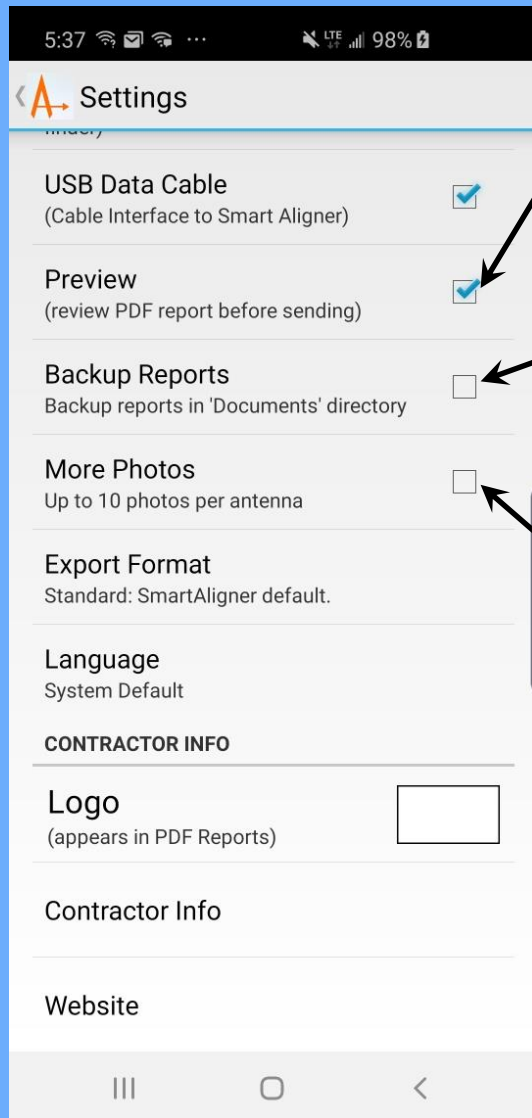
# App Menu – Settings



8. If you are using a Bluetooth enabled TruPulse 200 (made by LTI), check this box. Please see AGL Measurements Course for detailed information (default off). Not available with iOS (Apple) phones.
9. If you want to use the optional USB Data Cable for wired communication to the Tool, select this box (default on). Not available with iOS (Apple) phones. See Miscellaneous Options Course.



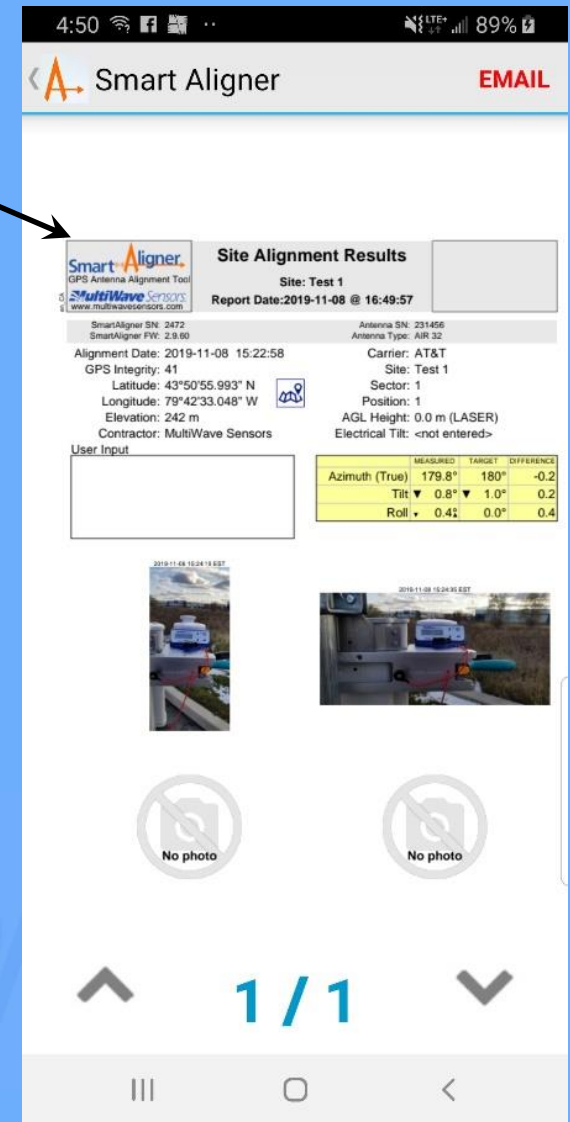
# App Menu – Settings



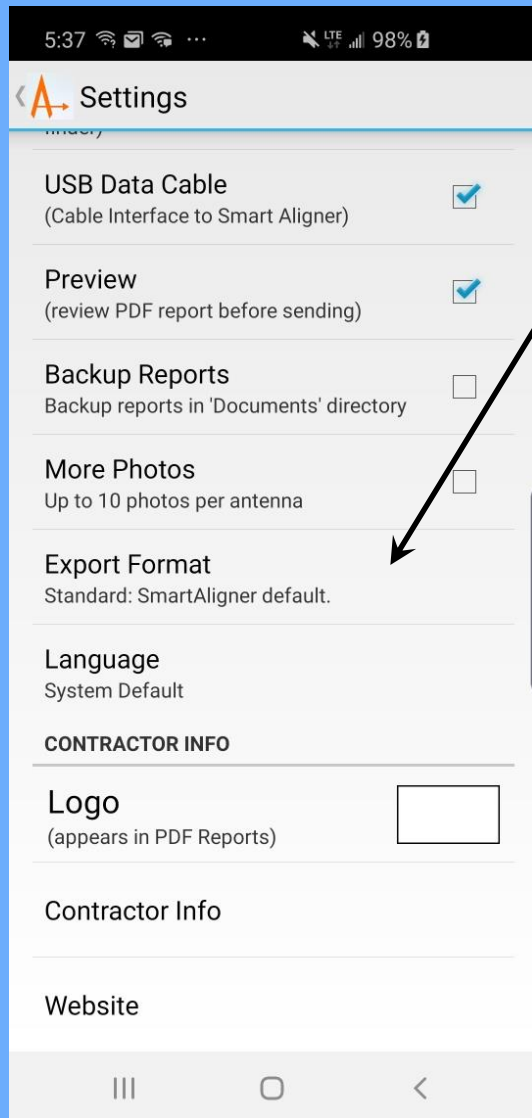
10. If Preview is selected (default), you can view the PDF Report before emailing it.

11. For automatic Report backup into the Documents directory, set this option.

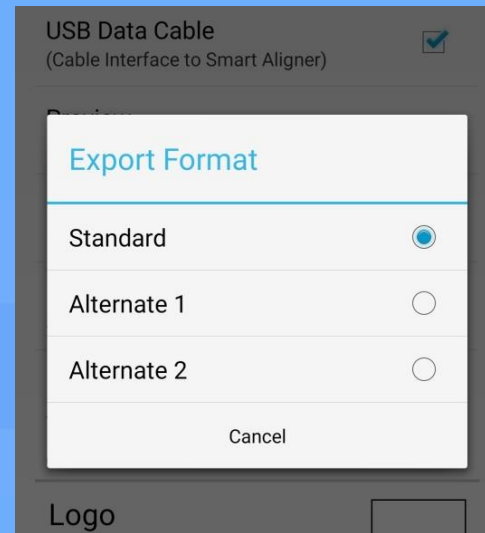
12. Choose this option if you require more than 4 photos per survey. If chosen, each antenna PDF will have two pages.



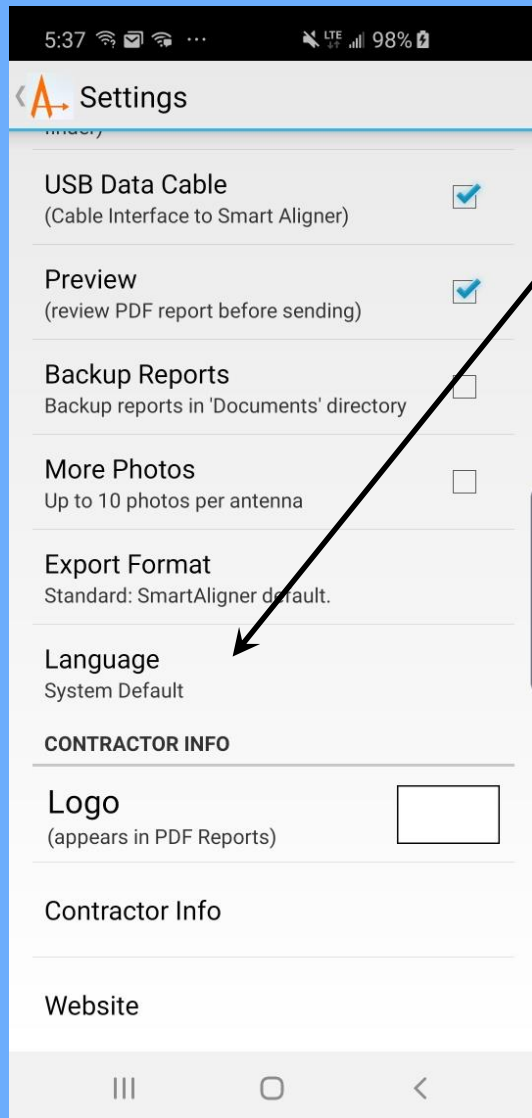
# App Menu – Settings



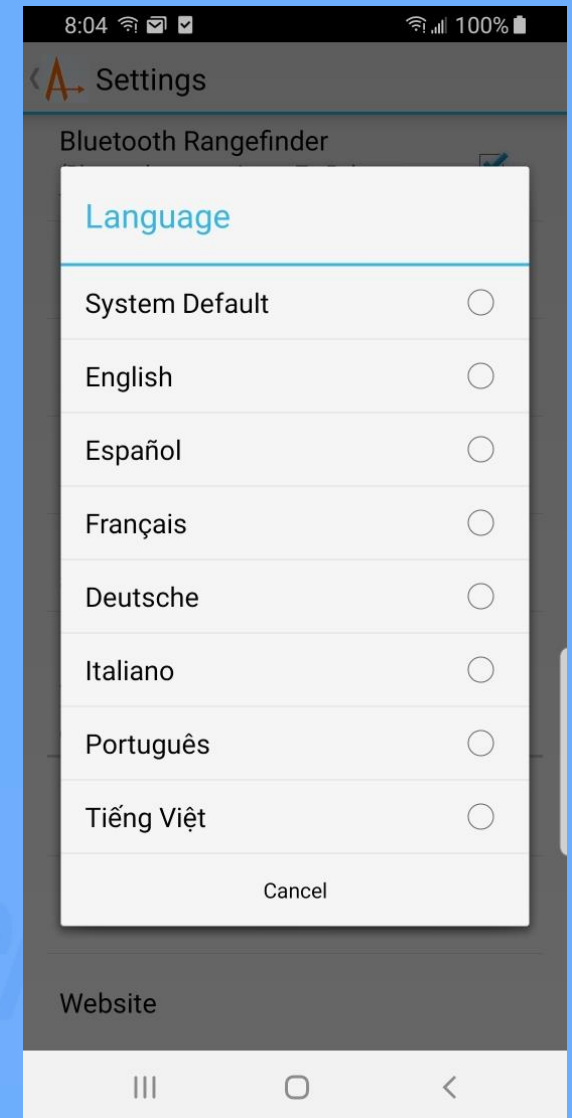
13. The complete Site Database can be exported. You can change the format with this option (default is Standard and is recommended). For more information, see Exporting a Site later in this course. Optional formats are as follows:



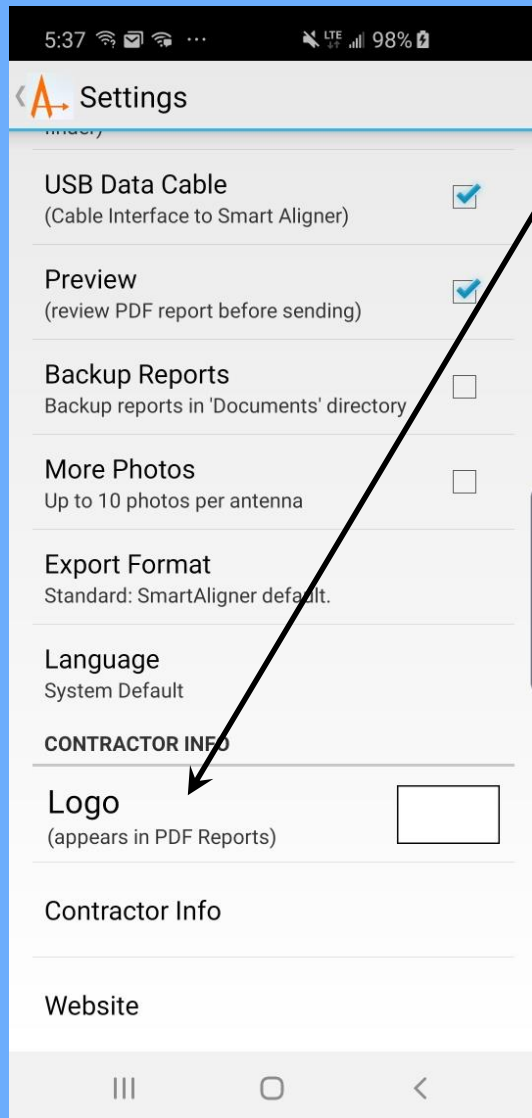
# App Menu – Settings



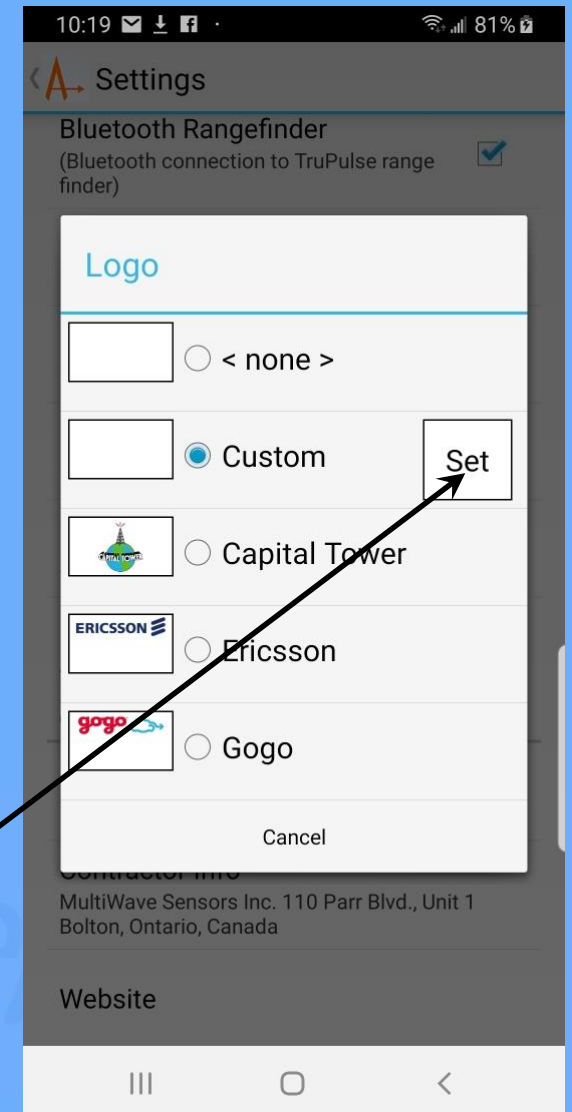
14. The Android app has multiple languages (not available on iOS devices). The list of currently available languages is shown to the right. If System Default is selected, the app will try to match the language with the operating system language.



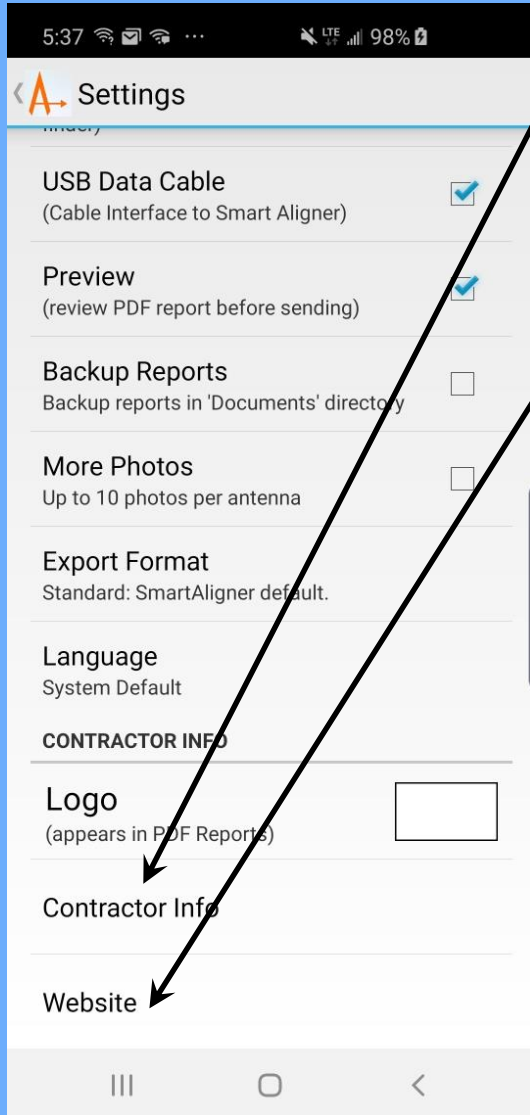
# App Menu – Settings



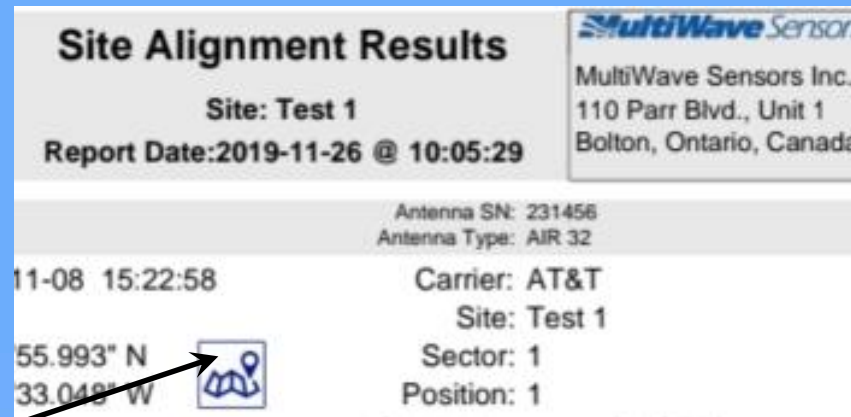
15. Choose from the available list for the logo to appear in the upper right corner of the report. If you want to add your logo, place the logo graphic file (JPEG or PNG) in Downloads directory on the Android phone, or My Albums directory on the iOS phone, and then select Set in the Custom area. Select your logo in the directory.



# App Menu – Settings



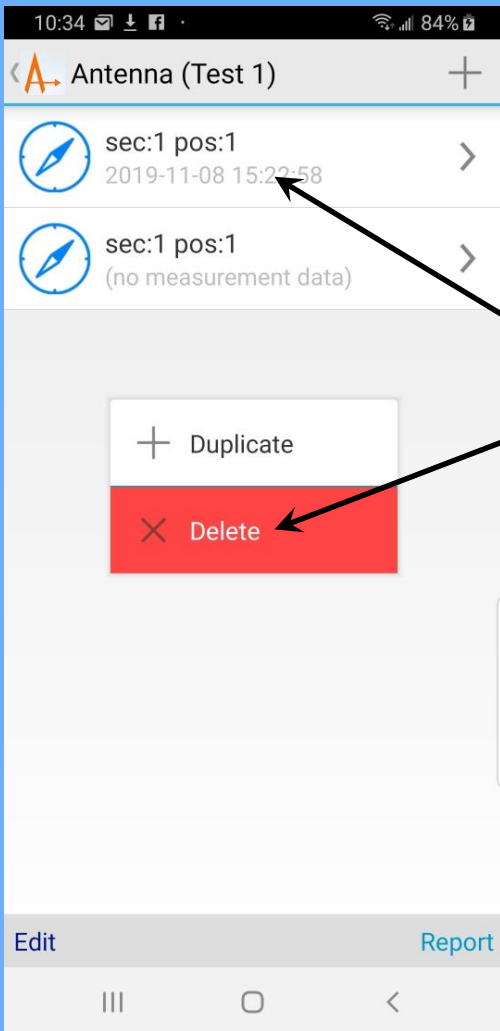
16. The Contractor Info will appear in the Contractor Box in the upper right corner of all of the reports as can be seen below with custom logo.
17. If a website is entered, it will create a hotlink in the PDF report when you tap the contractor box (Android only).



18. A Geotag will appear on an Android generated report. Tap the icon on a PC and the site location will appear in Google Maps.

# Deleting an Antenna File

1. If an antenna has been surveyed incorrectly, you may want to *Delete* it. In the Android app, press and hold the file until a menu pops up. Choose *Delete* and confirm. In iOS (Apple), choose *Select* in the bottom left and check off which file is to be Deleted. Then choose *Delete* in the upper right corner and confirm.



Android App Screen

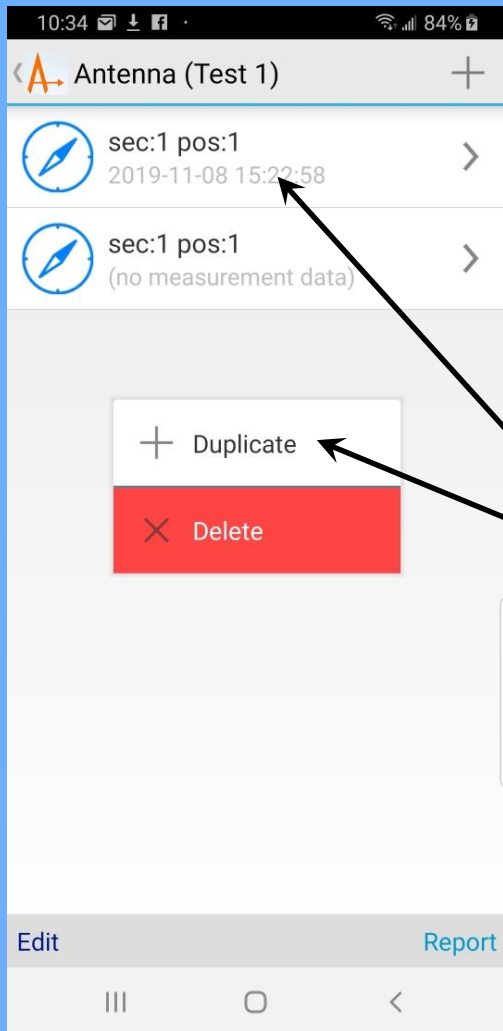


iOS App Screen

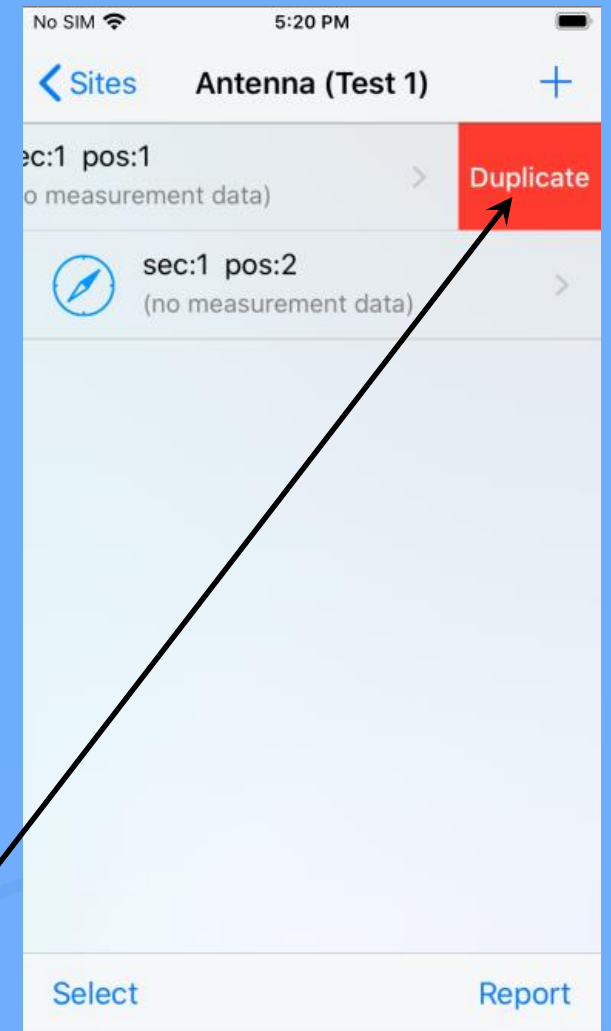


# Duplicating an Antenna File

2. After manually entering the information for the site's first antenna, you can duplicate the file and change its Position/Sector, targets and serial number. For Android, press and hold the antenna file you wish to duplicate and a menu will appear. Choose *Duplicate*. For iOS, swipe to the left and the *Duplicate* box will appear in red. Select Duplicate.

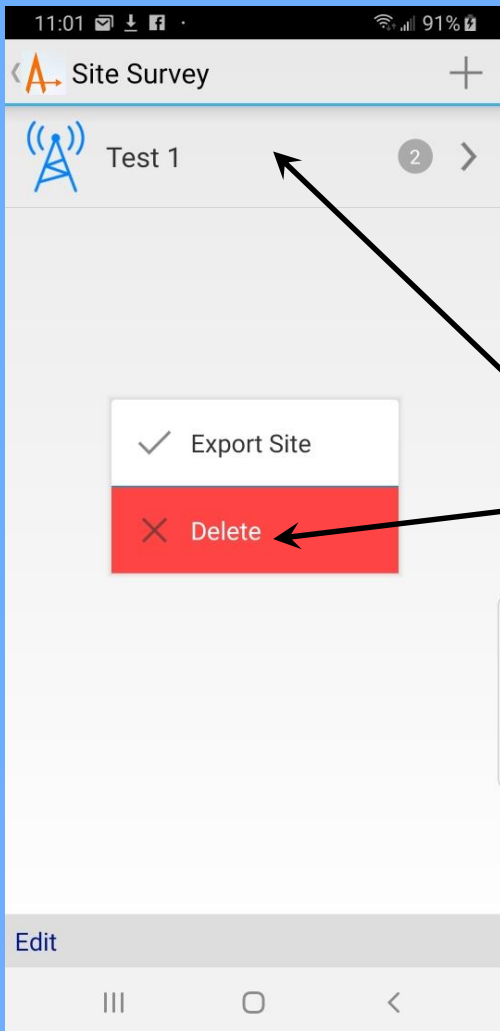


Android App Screen



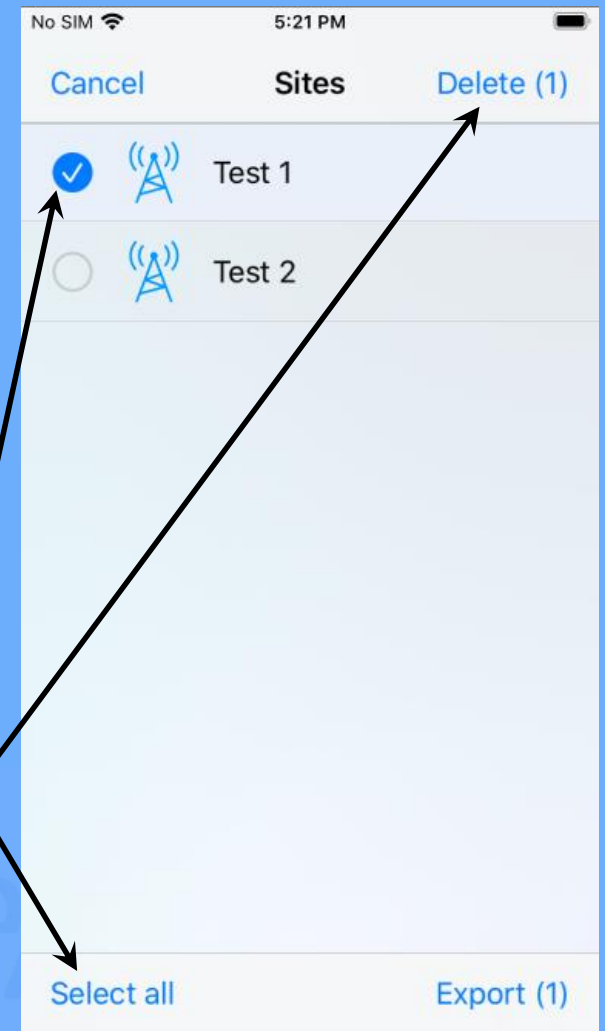
iOS App Screen

# Deleting a Site



Android App Screen

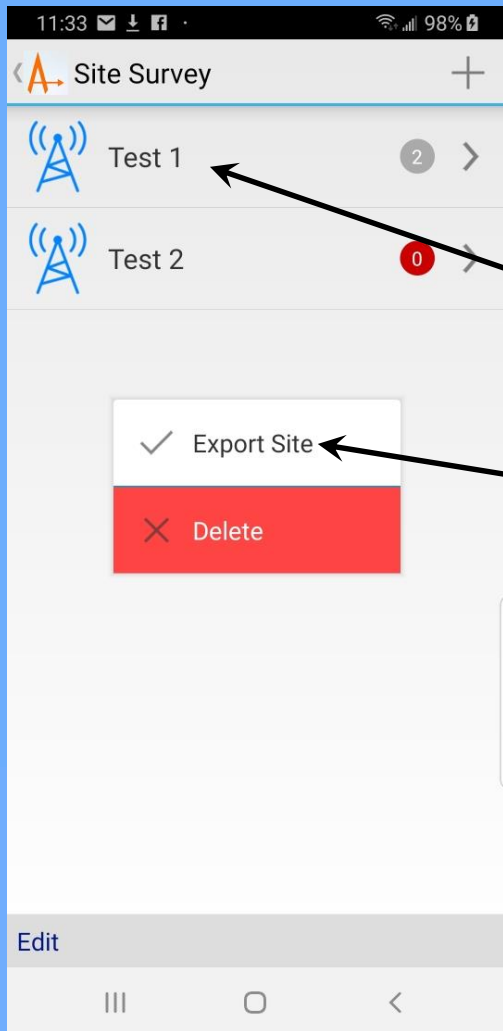
3. If a Site is complete and all reports have been made, you may want to *Delete* it for housekeeping purposes. In the Android app, press and hold the Site until a menu pops up. Choose *Delete* and confirm. In iOS (Apple), choose *Select* in the bottom left and check off which Site is to be Deleted. Then choose *Delete* in the upper right corner and confirm.



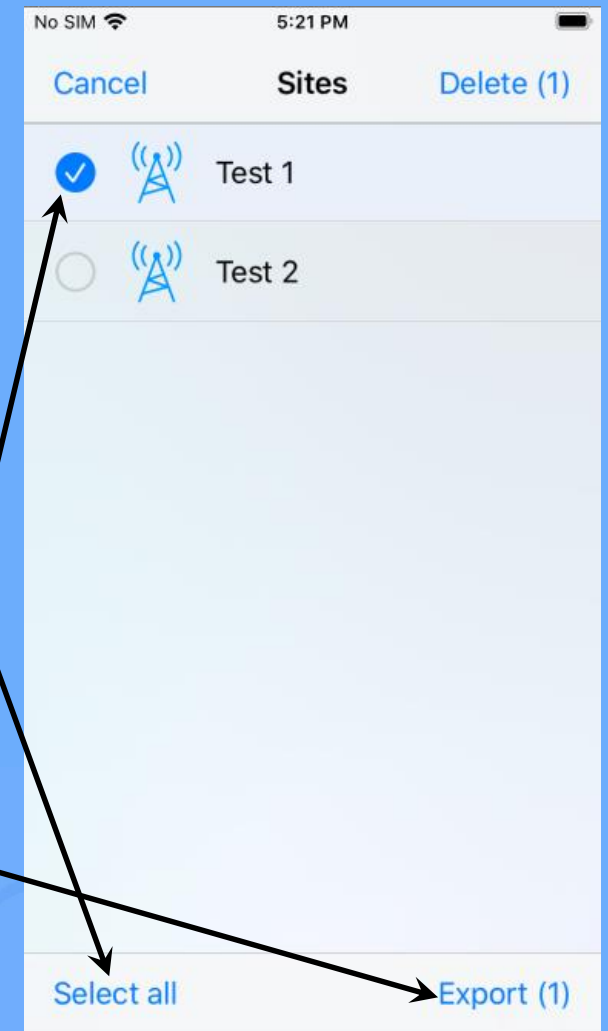
iOS App Screen

# Exporting a Site

4. Some carriers require complete Site information in the form of a spreadsheet. For Android, press and hold the Site you wish to Export and a menu will appear. Choose *Export Site* and email. In iOS (Apple), choose *Select* in the bottom left and check off which Site is to be Exported. Then choose *Export* in the lower right corner and email.



Android App Screen



iOS App Screen

# Exporting a Site

5. The format of the exported Site file is comma-separated values (CSV), which can be read into any database and readily viewed by Excel. Each line of the file is one antenna survey.

#	SiteID	Sector	Position	TargetAz	Azimuth	TargetMe	TargetM	Electrios	Carrier	Contract	Antenne	SerialNu	UserInpu	UserInpu	UserInpu	UserInpu	Date	Time	Measure	Azimuth	Measure	Measure	Latitude	Director	Longitud	Director	Elevatior	Elevatior	aglHeigh	aglHeigh	aglHeigh	GPSinte	PhotoID	PhotoID	PhotoID	PhotoID	StoredD	UTCoffs	ToolSeri	Firmw are	DO NOT EDIT
2	Demo1	1	1	60		-0.5	0		verizon	MultWai	AIR32	1134					4/15/2016	10:38:58	60.3	T	-0.4	-0.1	32.982	N	97.024	W	481	ft		LASER	79	2016y04	2016y04	2016y04	2016y04	0	-4	1231	2.4.00	0xe6a3724	
3	Demo1	2	1	180		-0.5	0		verizon	MultWai	AIR32	1134					4/15/2016	10:35:09	179.9	T	-0.5	0.3	32.982	N	97.024	W	476	ft		LASER	20	2016y04	2016y04	2016y04m15d-T11	0	-4	1231	2.4.00	0xb3927c2b		
4	Demo1	3	1	300		-0.5	0		verizon	MultWai	AIR32	1134					4/15/2016	10:16:58	300.4	T	-0.4	0.1	32.982	N	97.024	W	480	ft	6	ft	USER	61	2016y04	2016y04	2016y04	2016y04	0	-4	1231	2.4.00	0xc0854e3

User Input Information  
(entered through app)

Measurement Information  
(produced after Verification)

# Importing a Site

1. The previous section provided information on how to Export completed Site CSV files. This same methodology can be used to create Sites and Antenna Files automatically within the Smart Aligner app.
2. Take an existing exported Site CSV file (Standard Format) and copy it and rename it to a New Site that you want to create (keep in CSV format).
3. Open the new file in Excel.
4. Delete all the measurement data from the file (yellow highlight).

#	SiteID	Sector	Position	TargetAz	Azimuth	TargetMe	TargetM	Electrica	Carrier	Contract	Antenna	SerialNu	UserInpu	UserInpu	UserInpu	UserInpu	UserInpu	Date	Time	Measure	Azimuth	Measure	Latitude	Director	Longituc	Director	Elevatior	Elevatior	aglHeigh	aglHeigh	aglHeigh	GP	Sinte	PhotoID	PhotoID	PhotoID	PhotoID	StoredD	UTCoffs	ToolSeri	Firmware	DO NOT EDIT
1	Demo 1	1	1	60		-0.5	0		verizon	MultiWax	AIR32	1134						4/15/2016	10:38:58	60.3	T	-0.4	-0.1	32.982	N	97.024	W	481	ft		LASER	79	2016y04	2016y04	2016y04	2016y04	0	-4	1231	2.4.00	0xe6a3724	
2	Demo 1	2	1	180		-0.5	0		verizon	MultiWax	AIR32	1134						4/15/2016	10:35:09	179.9	T	-0.5	0.3	32.982	N	97.024	W	476	ft		LASER	20	2016y04	2016y04	2016y04	m15d-T1	0	-4	1231	2.4.00	0xb3927c2b	
3	Demo 1	3	1	300		-0.5	0		verizon	MultiWax	AIR32	1134						4/15/2016	10:16:58	300.4	T	-0.4	0.1	32.982	N	97.024	W	480	ft	6	ft	USER	61	2016y04	2016y04	2016y04	2016y04	0	-4	1231	2.4.00	0xc0854e3

# Importing a Site

5. Delete all rows of user input data except the first row (yellow highlight).

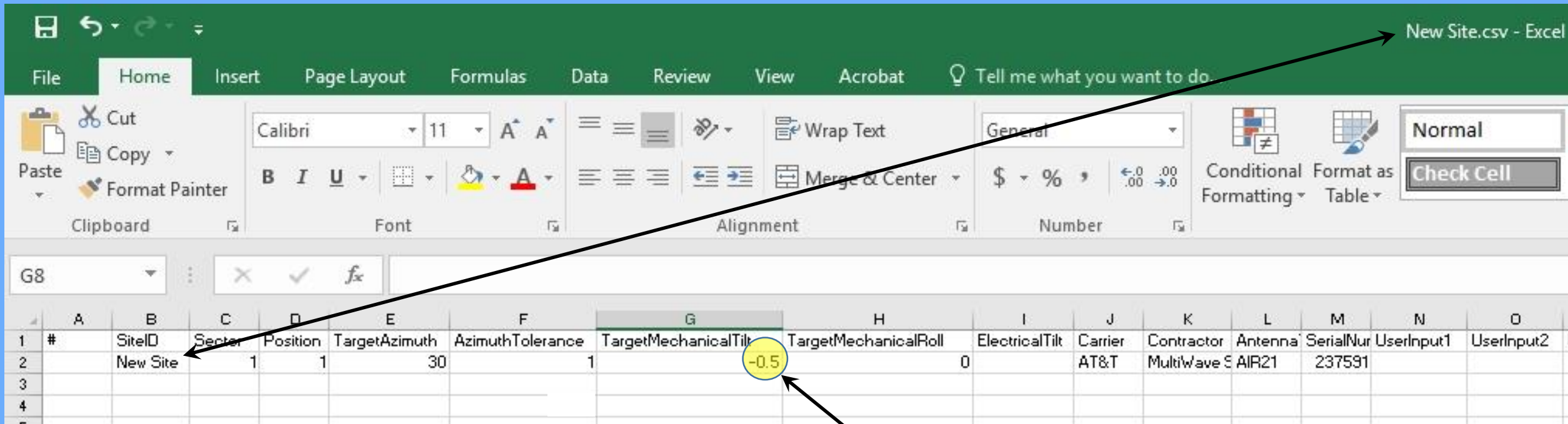
The screenshot shows the Microsoft Excel interface with the following data in the spreadsheet:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	#	SiteID	Sector	Position	TargetA: Azimuth	TargetMe	TargetM	Electrica	Carrier	Contract	Antenna	SerialNu	UserInput1	UserInput2	UserInput3	UserInput4	UserInput5	Date	Time	Measure	
2		Demo 1	1	1	60	-0.5	0	verizon	MultiWav	AIR32	1134										
3		Demo 1	2	1	180	-0.5	0	verizon	MultiWav	AIR32	1134										
4		Demo 1	3	1	300	-0.5	0	verizon	MultiWav	AIR32	1134										
5																					



# Importing a Site

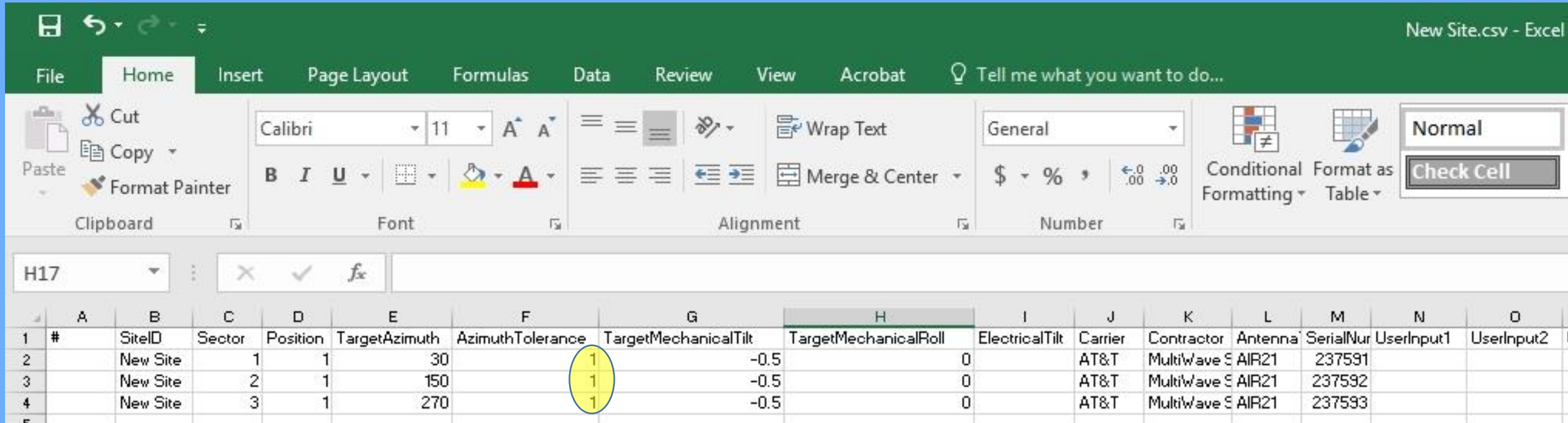
6. Edit the first row with information on the first antenna at the new Site. Make sure to change the SiteID to the new site name (New Site in this example).



7. As learned in the Introductory Course, Tilt and Roll directions use graphic symbols, but this file requires a +/- sign (yellow highlight). Down Tilt and Clockwise Roll are negative.

# Importing a Site

- Copy the first row and edit the new lines with new Sector/Position, Azimuth and serial number information.



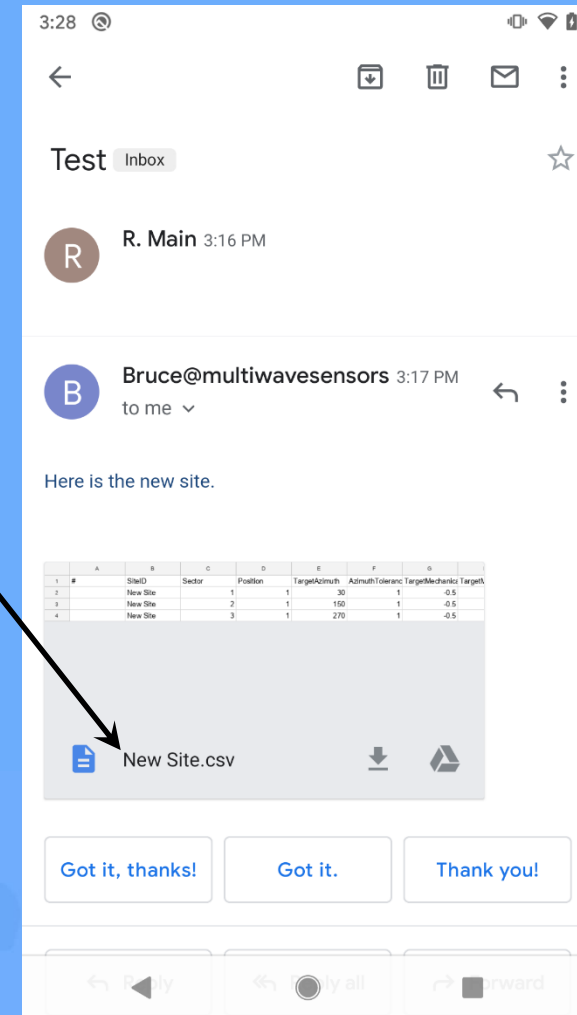
The screenshot shows the Microsoft Excel interface with a spreadsheet titled "New Site.csv". The ribbon is set to "Home". The spreadsheet has the following data:

#	SiteID	Sector	Position	TargetAzimuth	AzimuthTolerance	TargetMechanicalTilt	TargetMechanicalRoll	ElectricalTilt	Carrier	Contractor	Antenna	SerialNur	UserInput1	UserInput2
2	New Site	1	1	30	1	-0.5	0		AT&T	MultiWave S	AIR21	237591		
3	New Site	2	1	150	1	-0.5	0		AT&T	MultiWave S	AIR21	237592		
4	New Site	3	1	270	1	-0.5	0		AT&T	MultiWave S	AIR21	237593		

- This is the only time that an Azimuth Tolerance (yellow highlight) can be specified. The user will be warned after Verification if the measured azimuth is outside the Tolerance.

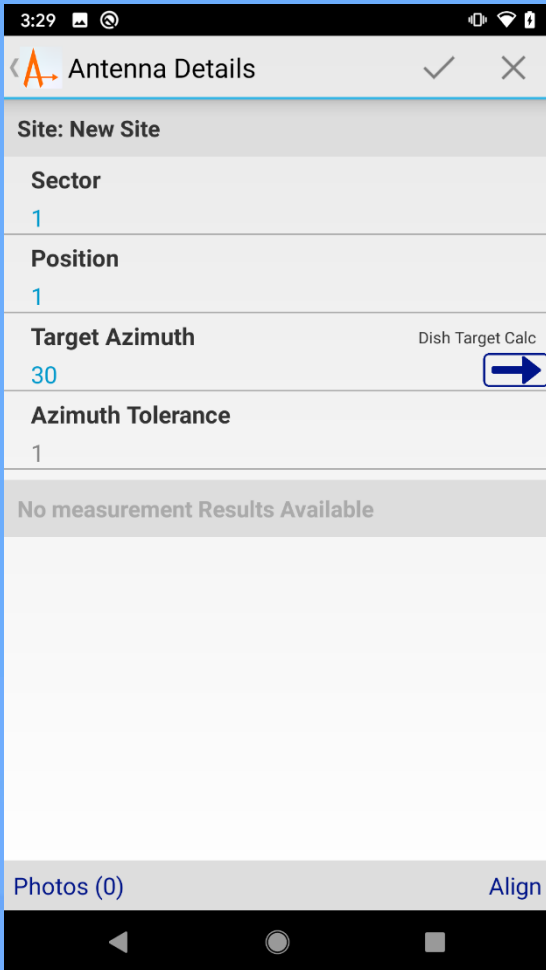
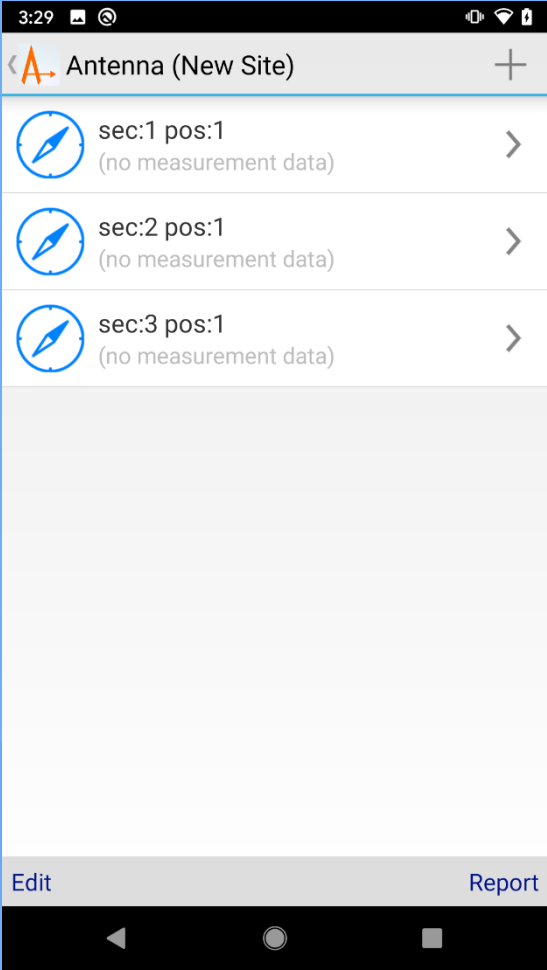
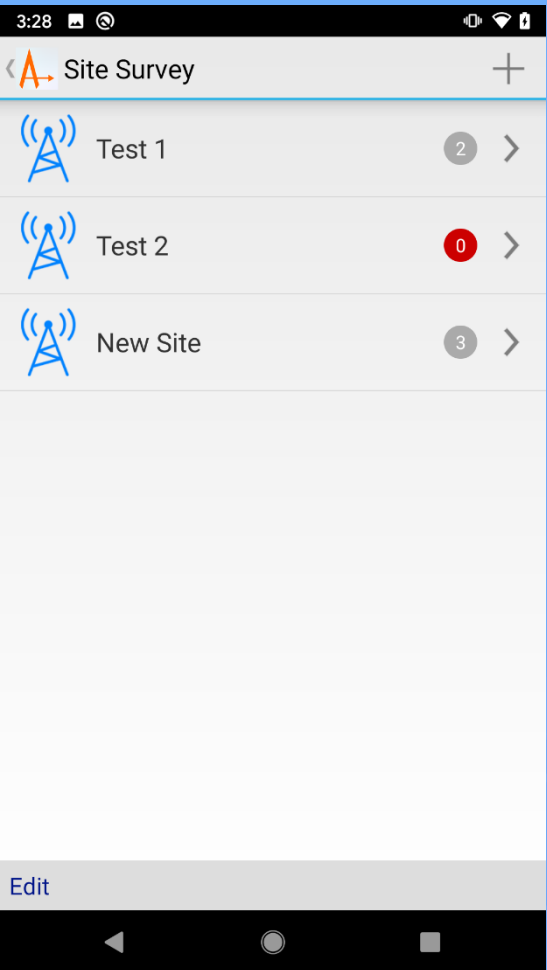
# Importing a Site

10. Save the CSV file (make sure it has a CSV extension) and email it to the tower hand who will be working at that new site.
11. Upon receiving the email with the new site CSV file, the tower hand can tap the attachment and the Smart Aligner app should start automatically and import the New Site and Antenna Files. If more than one app is available to open the CSV file, select Smart Aligner (iOS users may have to select Share then the SA app icon).



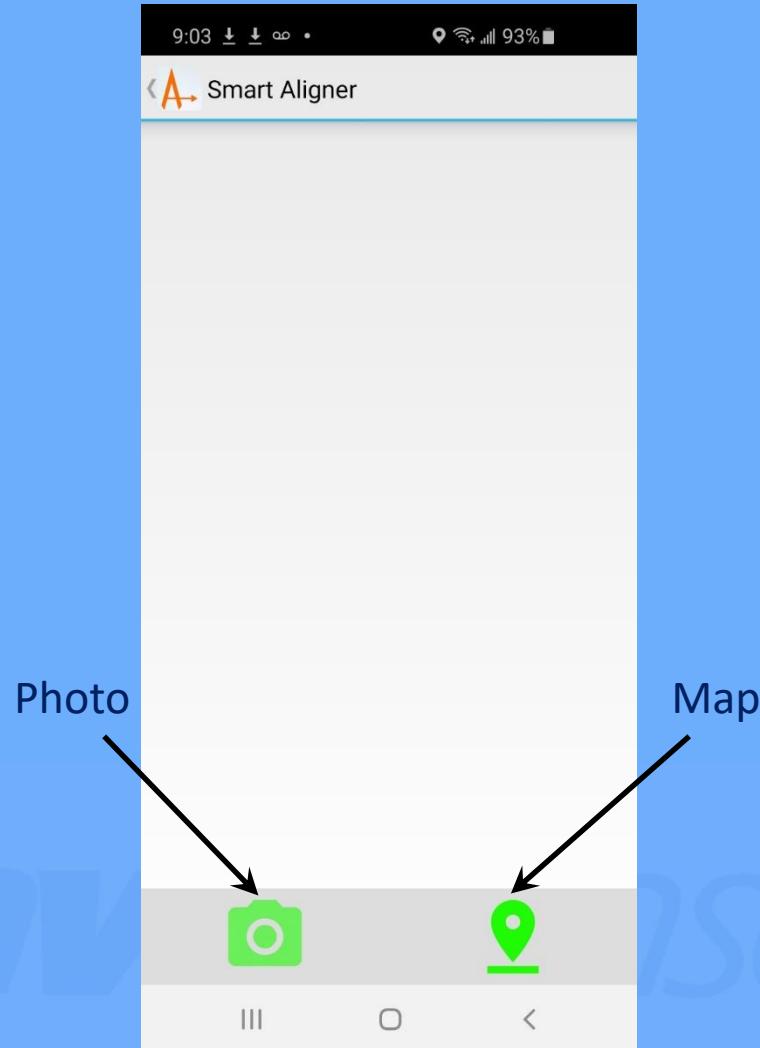
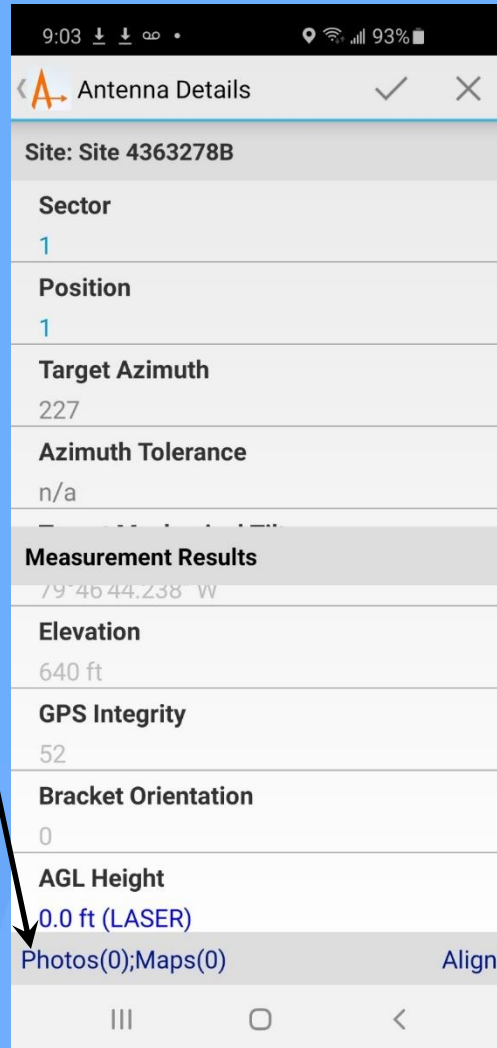
# Importing a Site

12. The New Site is imported with all of the antenna files ready for surveying.



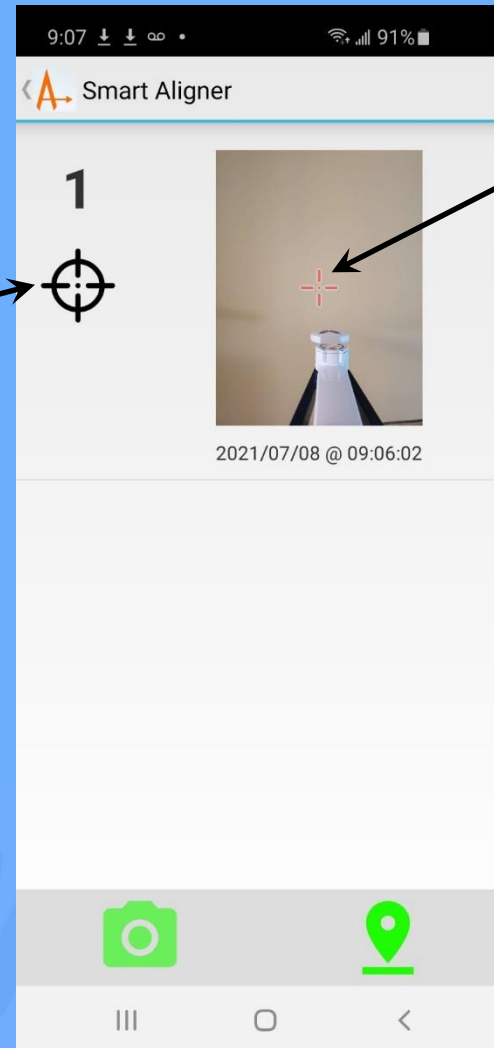
# Enhanced Photo/Map Features (Android app only)

1. The typical Photo button is now replaced with Photos/Maps. Once selected, you can choose to take a Photo or a Map.



# Enhanced Photo/Map Features (Android app only)

2. A crosshair can be added to any photo (especially line-of-sight) by tapping the crosshair icon after the photo is taken. The crosshair can also be removed by selecting the icon again.

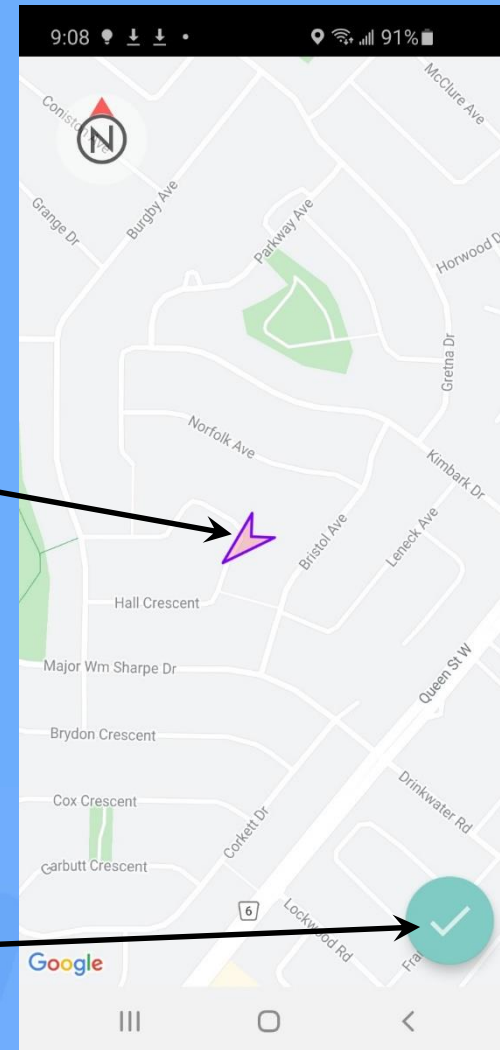


Take a Line-of-Sight (LOS) image and overlay a crosshair



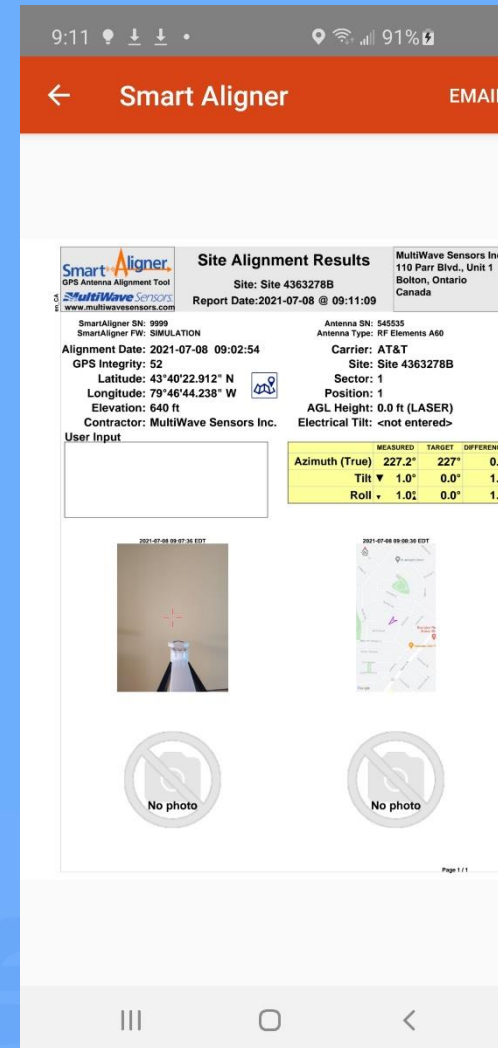
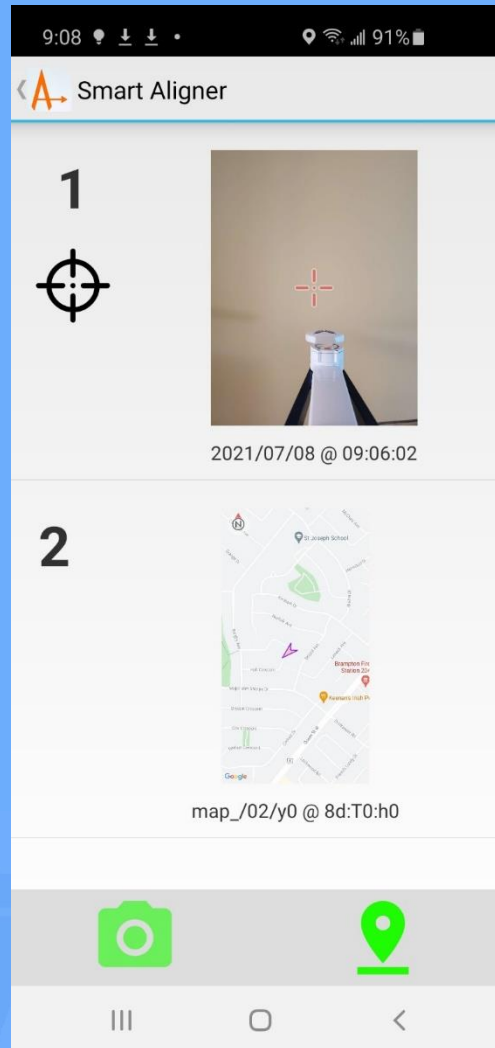
# Enhanced Photo/Map Features (Android app only)

3. If the Map icon is selected, a Google image with the antenna direction represented by an arrow will appear. The map scale can be dynamically changed by using the touch screen. Once the image scale is acceptable, select the Checkmark to Save.



# Enhanced Photo/Map Features (Android app only)

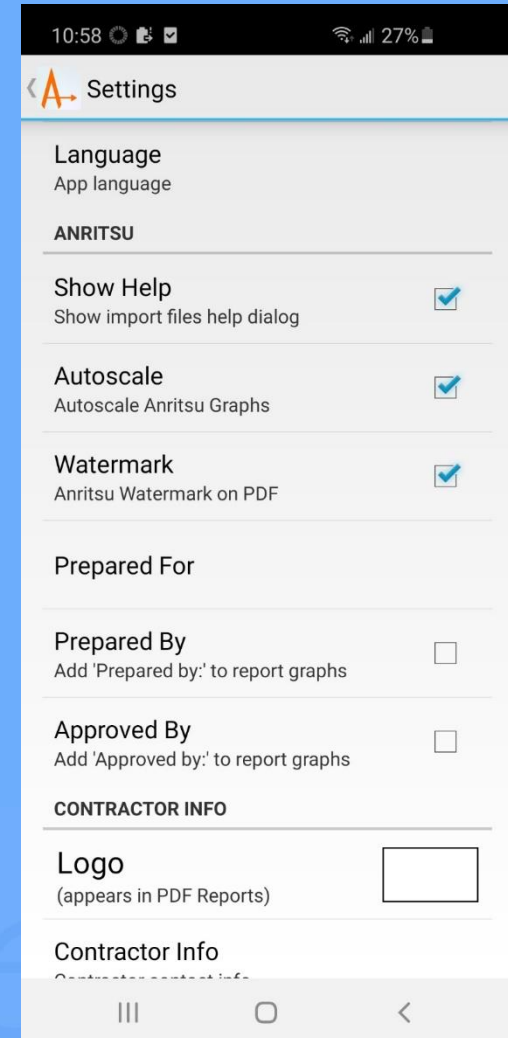
4. The images will appear in the image summary screen to the near right. The resulting PDF report will appear in the preview screen on the far right.



# Anritsu File Integration

MultiWave Sensors, in partnership with Anritsu, has provided a file utility in order to import Anritsu Line Sweep files so that graphs can be created in the field without the need for Anritsu's Line Sweep Tools (LST). In the Settings screen, there are some parameters that apply directly to this process as can be seen to the right.

All choices are self explanatory for LST users. The Help utility may be useful for the first few file imports.



# Anritsu File Integration

This is assuming that you already have a Smart Aligner Antenna Alignment System and know the basic operations of the hardware and Smart Aligner App. If not, please view the Introductory Course and this complete course.

## Hardware Required

- Android** phone or Tablet (not implemented for iOS)
- USB flash drive + USB-C to USB adapter   **OR**    Dual USB flash drive

## Setting up the Hardware

Since Android phones have a USB-C port, most USB flash drives cannot physically connect to the USB-C port. There are two options:

**Option 1:** You already have a USB flash drive\*\* so you need an adapter to convert the USB on the flash drive to USB-C.  
\*\*NOTE: Try to use a newer USB flash drive as some older ones will not work on the phone.

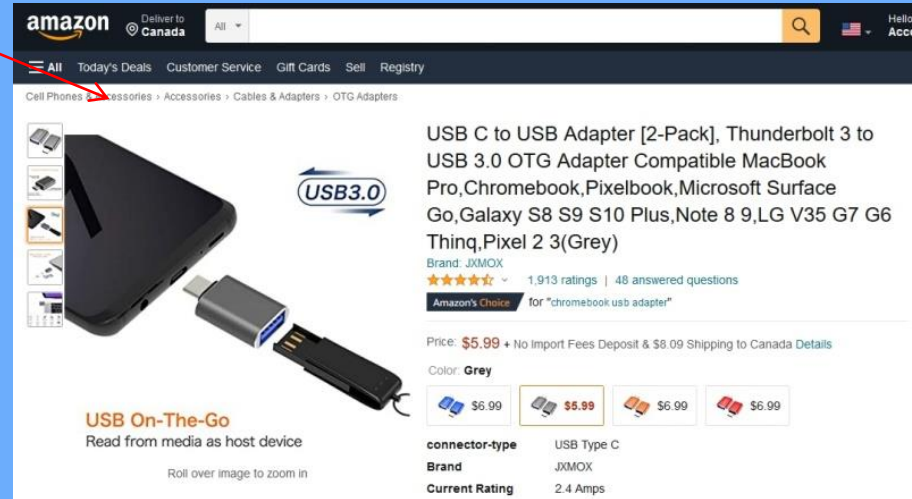
**Option 2:** Use a Dual USB flash drive. This type of drive has a USB port on one end and a USB-C on the other end.  
(See next pages for details)

# Anritsu File Integration

## Option 1



USB-C to USB  
adapter



Connect the adapter and USB flash drive to the phone.  
You are now ready to transfer data to the phone

# Anritsu File Integration

## Option 2



Dual USB  
flash drive



Connect the Dual USB flash drive to the phone.  
You are now ready to transfer data to the phone





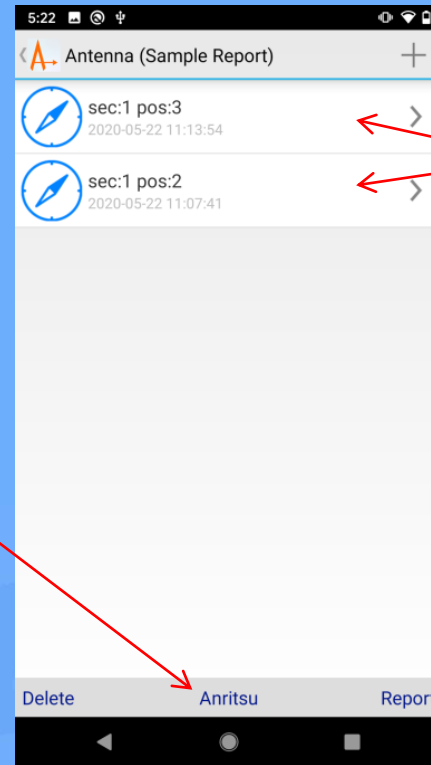
# Anritsu File Integration

## Transferring data to the phone

1. Download Line Sweep data to the USB flash drive.
2. Insert USB flash drive to phone as per option 1 or 2.

3. In the Smart Aligner App select the Site that you want to download the Anritsu data from.

4. Tap “Anritsu”

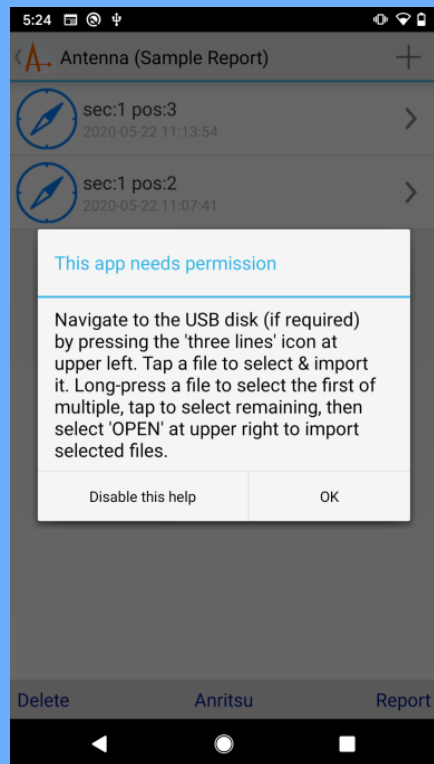


**Antenna Alignment files**

# Anritsu File Integration

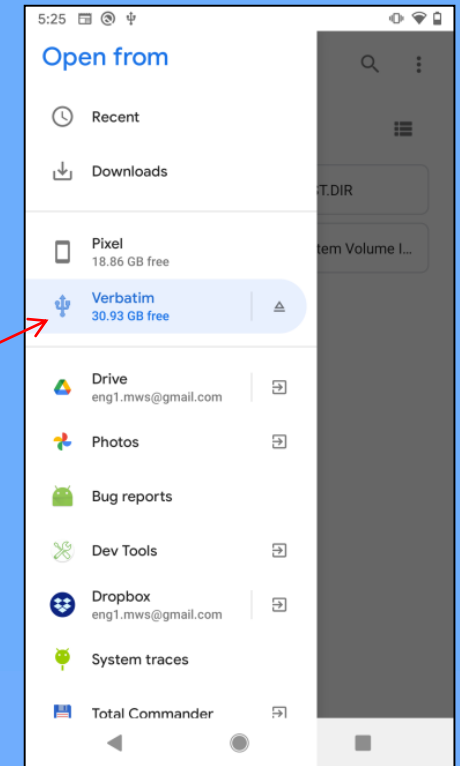
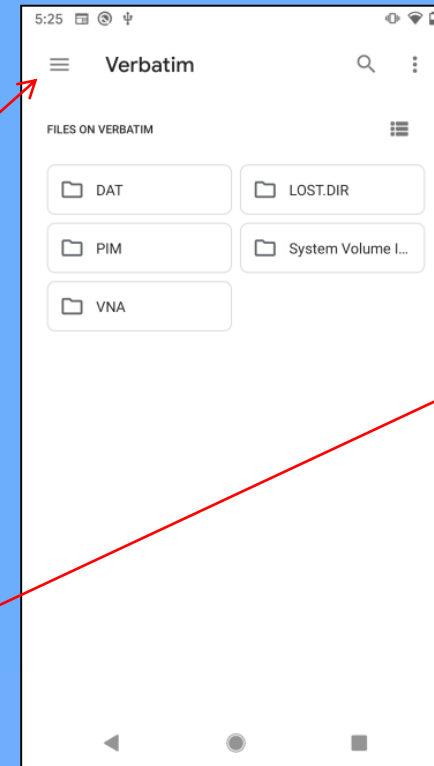
## Transferring data to the phone

5. Message will appear as below describing how to navigate the USB disk.



6. As the message described use the “three lines” icon to navigate the USB stick

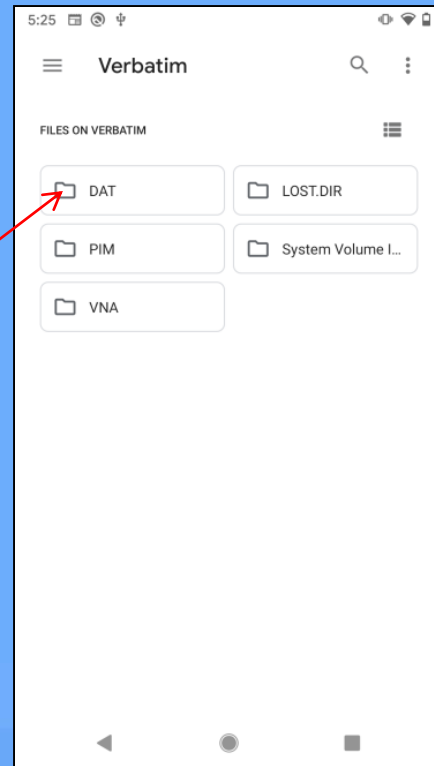
On the first time navigating it may go directly here. Select the USB drive (example: Verbatim)



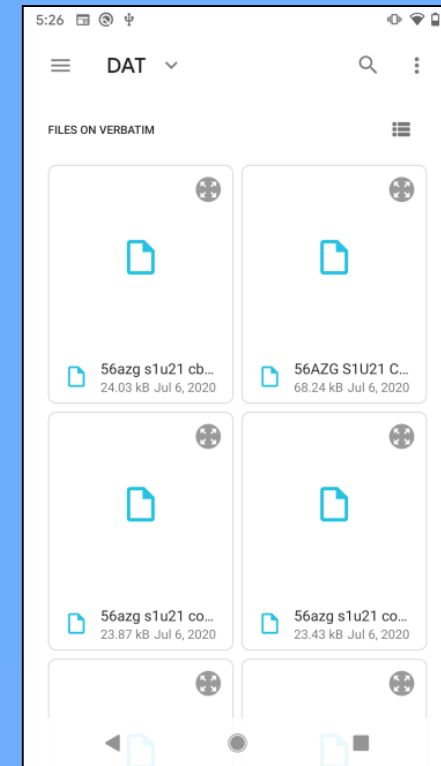
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## Transferring data to the phone

7. In this example we are selecting Line Sweep .dat files located in the user created DAT directory



8. All of the .dat files are displayed

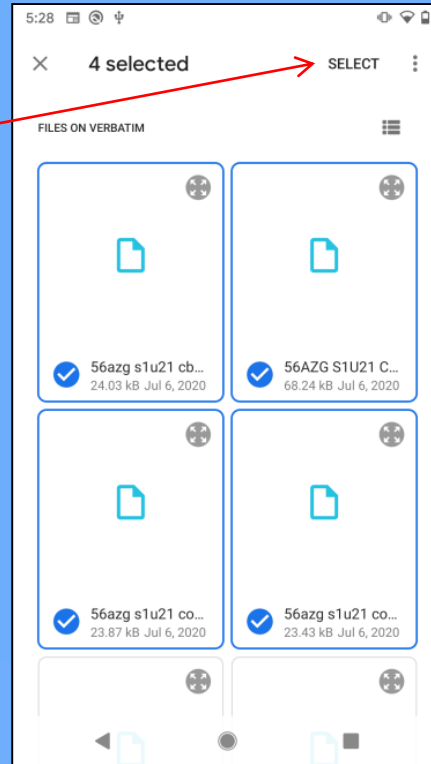


# Anritsu File Integration

## Transferring data to the phone

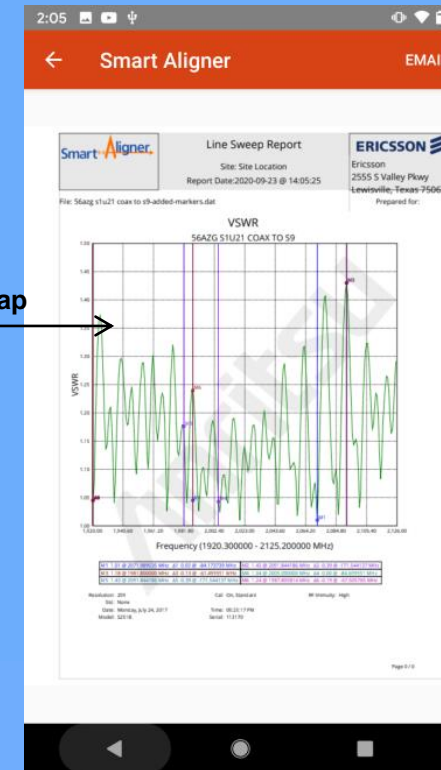
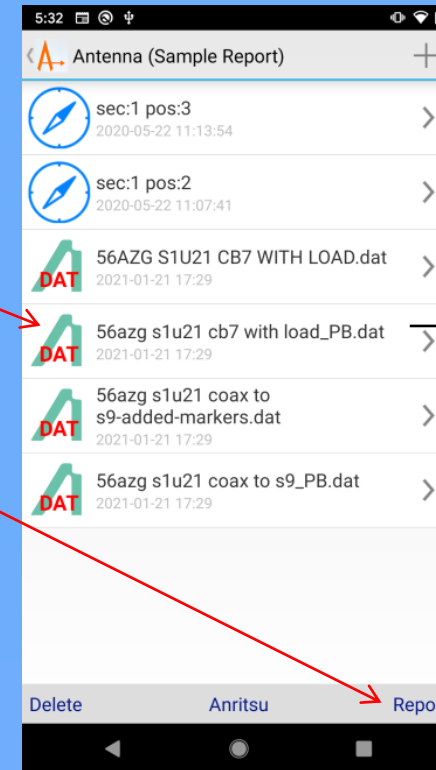
9. To select only one file tap the file and then tap SELECT.

To select multiple files long tap the first file you want to include and then tap the others. After all files are selected tap SELECT .



10. Files have now been downloaded to the Site. Each file can be previewed by tapping it.

Create a Report



# Course End

## Other Available Courses

1. AGL Measurements
2. Aligning Microwave Dishes
3. Universal Bracket and Inserts
4. Custom Brackets
5. Miscellaneous Options
6. Ericsson AIR Antennas
7. Trouble Shooting and Tips

